

The invention claimed is:

1. A method at a decoder comprising:

selecting for output as each individual decoded bit in a block of bits from among all possible bits values, or a sequence of bits that comprise a block of bits from among all possible sequences of bits, the bit value or the  
5 sequence of bits, respectively, that is determined to have a maximum likelihood;

characterized in that:

for each individual bit in the block of bits when each possible bit value  
10 is determined to be equally likely for that bit, outputting from among each possible equally likely bit value the bit value whose weight is greater than the equally likely bit value whose weight is a minimum, and for a sequence of bits together in the block when more than one sequence is determined to have the same maximum likelihood, outputting the maximum likelihood sequence  
15 of bits whose weight is greater than the maximum likelihood sequence of bits that has the minimum weight.

2. The method of claim 1 wherein for each individual bit in the block the possible bit values are a ZERO and a ONE, and when for a bit they are both determined to be equally likely, a ONE is outputted.

20 3. The method of claim 1 wherein for the sequence of bits when more than one sequence is determined to have the same maximum likelihood, the maximum likelihood sequence outputted is the sequence having the largest weight.

4. The method of claim 1 wherein the method is performed at a decoder in a receiver in a wireless communications system.

5. The method of claim 4 wherein an all-ZERO decoder output is avoided in the presence of weak signal conditions.

5        6. A method at a decoder comprising:

selecting for output as each individual decoded bit in a block of bits from among all possible bit values, or a sequence of bits together in a block of bit from among all possible sequences of bits, the bit value or the sequence of bits, respectively, that is determined to have a maximum likelihood;

10       characterized in that:

for each individual bit in the block of bits when each possible bit value is determined to be equally likely, randomly outputting one of the equally likely bit values, and for a sequence of bits when more than one sequence is determined to have the same maximum likelihood, randomly outputting one of  
15       the maximum likelihood sequences.

7. The method of claim 6 wherein for a sequence of bits, the randomly outputted sequence of bits is chosen from among the maximum likelihood sequences that excludes the maximum likelihood sequence that has the minimum weight.

20       8. The method of claim 6 wherein the method is performed at a decoder in a receiver in a wireless communications system.

9. The method of claim 8 wherein an all-ZERO decoder output is avoided with high probability in the presence of weak signal conditions.

10. A method at a decoder comprising:

selecting for output for each decoded bit individually in a block of bits the bit value of a ZERO or a ONE that is determined to the most likely, characterized in that:

when for each individual bit that a bit value of a ZERO and a ONE are  
5 determined to be equally likely, outputting the bit value of a ONE.

11. The method of claim 10 wherein the method is performed at a decoder in a receiver in a wireless communications system.

12. The method of claim 11 wherein an all-ZERO decoder output is avoided in the presence of weak signal conditions.

10 13. A method at a decoder comprising:

selecting for output as a decoded sequence of bits in a block of bits from among all possible sequences of bits, the sequence of bits that is determined to have the maximum likelihood;

characterized in that:

15 when more than one sequence is determined to have the same maximum likelihood, outputting from among those maximum likelihood sequences the sequence whose weight is greater than the sequence having the minimum weight.

14. The method of claim 13 wherein the maximum likelihood  
20 sequence outputted is the one having the largest weight among the maximum likelihood sequences.

15. The method of claim 13 wherein the method is performed at a decoder in a receiver in a wireless communications system.

16. The method of claim 14 wherein an all-ZERO decoded sequence of bits is avoided in the presence of weak signal conditions.

17. Apparatus comprising:

means for receiving set of soft symbol metric values representing a  
5 transmitted block of data bits;

decoding means, in response to the received set of soft symbol metric values, for selecting for output as each individual decoded bit the bit that is determined to have a maximum likelihood, wherein when for a bit a ONE and ZERO are equally likely, a bit value of ONE is selected.

10 18. The apparatus of claim 17 wherein the decoding means is a turbo decoder.

19. Apparatus comprising:

means for receiving a set of soft symbol metric values representing a  
transmitted block of data bits;

15 decoding means, in response to the received set of soft symbol metric values, for selecting for output as a decoded sequence of bits from among all possible sequences of bits, the sequence of bits that is determined to have the maximum likelihood, wherein when more than one sequence is determined to have the same maximum likelihood, the sequence outputted is  
20 the maximum likelihood sequence whose weight is greater than the maximum likelihood sequence having the minimum weight.

20. The apparatus of claim 19 wherein the decoding means is a Viterbi decoder.